WHAT IS CLAIMED IS:

1. A method for planning and scheduling mass production of items according to customer orders comprising:

repeating a series of steps a plurality of times during a manufacturing shift, the series of steps comprising:

using at least one outstanding customer order to generate a work schedule and a material delivery schedule, each customer order of the at least one outstanding customer order including at least one item, the generating the work schedule including scheduling work to manufacture each item of the at least one item on an operation of at least one operation on a manufacturing line, the generating the delivery schedule including scheduling a delivery of material to manufacture each item of the at least one item to the operation, wherein the scheduling the delivery includes scheduling the delivery of the material prior to the time the material is needed according to the work schedule;

providing the work schedule to the manufacturing line, substantially immediately after generating the work schedule, for initiating work to mass produce each of the at least one item according to the work schedule; and

providing the material delivery schedule for the delivery of the material to manufacture each item of the at least one item according to the material delivery schedule.

2. The method of claim 1 wherein

each time of the plurality of times that the series of steps is repeated is a repetition; and

the scheduling the delivery of the material prior to the time the material is needed according to the work schedule includes scheduling the delivery of the material at most one repetition prior to the time the material is needed.

3. The method of claim 1 wherein

the material is delivered from an available inventory of material at a material source.

4. The method of claim 2 wherein

the available inventory includes at least one of a group consisting of the following:

an in-house inventory; and

an external inventory.

5. The method of claim 4 wherein
the external inventory includes at least one of a group consisting of the following:
a supplier inventory; and
a hub inventory.

6. The method of claim 4 wherein
the available inventory further comprises an in-transit inventory.

7. The method of claim 1 wherein
the generating a work schedule comprises adding work to the work schedule; and
the generating a material delivery schedule comprises adding a delivery of the identified material from an available inventory of material to an operation of at least one operation on a manufacturing line to the material delivery schedule.

8. The method of claim 7 wherein
the adding the work to the work schedule comprises adding the work to the work schedule at a start time; and
the adding the delivery to the material delivery schedule comprises adding the delivery to the material delivery schedule at a material delivery time prior to the start time.

9. The method of claim 7 further comprising:
determining an expected availability of the identified material from the available inventory; and wherein
the adding the work to the work schedule includes adding the work at a start time after the expected availability of the identified material.

10. The method of claim 9 wherein the determining the expected availability of the identified material from the available inventory comprises:
determining whether the available inventory of material includes the identified material;
when the available inventory includes the identified material, determining a replenishment time for the identified material and using the replenishment time to determine the expected availability of the identified material;
when the available inventory does not include the identified material, determining that the

expected availability is that the identified material is not available.

11. The method of claim 10 wherein
the determining that the expected availability is that the identified material is not available further comprises flagging an exception.

12. The method of claim 7 wherein
the adding the work to the work schedule comprises adding the work to the work schedule according to a priority of the customer order.

13. The method of claim 7 wherein
the adding the work to the work schedule comprises adding the work to the work schedule according to an order date of the customer order.

14. The method of claim 1 wherein
the item is a commodity.

15. A method for planning and scheduling mass production of items according to customer orders comprising:
using a customer order for an item to determine material to manufacture the item;
identifying material to manufacture the item from an available inventory of the material;
adding work to a work schedule, the work being to manufacture the item at an operation of at least one operation of a manufacturing line using the identified material;
adding a delivery to a material delivery schedule, the delivery being of the identified material from the available inventory to the operation;
providing the work schedule to the manufacturing line for manufacturing the item according to the work schedule; and
providing the material delivery schedule for delivering the material according to the material delivery schedule.

16. The method of claim 15 wherein
a plurality of work schedules for one manufacturing line are generated during a manufacturing shift.

17. The method of claim 15 wherein
a plurality of material delivery schedules for one manufacturing line are generated during a

manufacturing shift.

18. The method of claim 15 wherein
the available inventory includes an external inventory.

19. The method of claim 18 wherein
the external inventory includes at least one of a group consisting of the following:
a supplier inventory; and
a hub inventory.

20. The method of claim 15 wherein
the adding the work to the work schedule comprises adding the work to the work schedule at a start time; and
the adding the delivery to the material delivery schedule comprises adding the delivery to the material delivery schedule at a material delivery time prior to the start time.

21. The method of claim 15 further comprising:
determining an expected availability of the identified material from the available inventory; and wherein
the adding the work to the work schedule includes adding the work at a start time after the expected availability of the identified material.

22. The method of claim 21 wherein the determining the expected availability of the identified material from the available inventory comprises:
determining whether the available inventory of material includes the identified material;
when the available inventory includes the identified material, determining a replenishment time for the identified material and using the replenishment time to determine the expected availability of the identified material;
when the available inventory does not include the identified material, determining that the expected availability is that the identified material is not available.

23. The method of claim 22 wherein
the determining that the expected availability is that the identified material is not available further comprises flagging an exception.

24. The method of claim 15 wherein

the adding the work to the work schedule comprises adding the work to the work schedule according to a priority of the customer order.

25. The method of claim 15 wherein
the adding the work to the work schedule comprises adding the work to the work schedule according to an order date of the customer order.

26. The method of claim 15 wherein
the available inventory comprises at least one of a group consisting of the following:
an in-house inventory; and
an external inventory.

27. The method of claim 26 wherein
the available inventory further comprises an in-transit inventory.

28. The method of claim 15 wherein
the item is a commodity.

29. The method of claim 15 wherein
the using a customer order includes using a plurality of customer orders.

30. The method of claim 15 further comprising:
assigning one of a plurality of manufacturing lines to the customer order.

31. The method of claim 15 wherein
the identified material includes a plurality of identified materials.

32. The method of claim 15 wherein
the adding the work to the work schedule includes adding a plurality of work to the work schedule.

33. The method of claim 15 wherein
the adding the delivery to the material delivery schedule includes adding a plurality of deliveries to the material delivery schedule.

34. The method of claim 15 wherein
the customer order includes a plurality of items.

35. A computer system comprising:

a processor; and

a memory, the memory storing instructions to be executed by the processor, the instructions comprising:

instructions for repeating a series of steps a plurality of times during a manufacturing shift; and

instructions for each step in the series of steps comprising:

instructions for using at least one outstanding customer order to generate a work schedule and a material delivery schedule, each customer order of the at least one outstanding customer order including at least one item, the work schedule including work to manufacture each item of the at least one item, the delivery schedule including delivery of material to manufacture each item of the at least one item;

instructions for providing the work schedule to a manufacturing line substantially immediately after generating the work schedule for initiating work to mass produce each of the at least one item according to the work schedule; and

instructions for providing the material delivery schedule for delivering the material to manufacture each item of the at least one item according to the material delivery schedule, wherein the material is scheduled to be delivered to an operation of at least one operation of the manufacturing line substantially immediately prior to the time the material is needed according to the work schedule.

36. The computer system of claim 35 wherein

the instructions to generate the material delivery schedule include instructions to generate the material delivery schedule such that the material scheduled to be delivered includes material scheduled to be delivered from an available inventory of material at a material source.

37. The computer system of claim 36 further comprising:

instructions for determining the available inventory from at least one of a group consisting of the following:

an in-house inventory; and

an external inventory.

38. The computer system of claim 37 wherein

the instructions for determining the available inventory from the external inventory include instructions for determining the available inventory from at least one of a group consisting of the following:

a supplier inventory; and

a hub inventory.

39. The computer system of claim 36 further comprising:

instructions for determining the available inventory from at least one of a group consisting of the following:

an in-house inventory;

an external inventory; and

an in-transit inventory.

40. The computer system of claim 35 wherein

the instructions to generate a work schedule comprise instructions for adding work to the work schedule; and

the instructions to generate a material delivery schedule comprise instructions for adding a delivery of the material from an available inventory of material to an operation of at least one operation on a manufacturing line.

41. The computer system of claim 40 wherein

the instructions for adding the work to the work schedule comprise instructions for adding the work to the work schedule at a start time; and

the instructions for adding the delivery to the material delivery schedule comprise instructions for adding the delivery to the material delivery schedule at a material delivery time prior to the start time.

42. The computer system of claim 40 further comprising:

instructions for determining an expected availability of the identified material from the

available inventory;
and wherein
the instructions for adding the work to the work schedule include instructions for adding the work at a start time after the expected availability of the identified material.

43. The computer system of claim 42 wherein the instructions for determining the expected availability of the identified material from the available inventory comprise:
instructions for determining whether the available inventory of material includes the identified material;
instructions for determining a replenishment time for the identified material and using the replenishment time to determine the expected availability of the identified material when the available inventory includes the identified material; and
instructions for determining that the expected availability is that the identified material is not available when the available inventory does not include the identified material.

44. The computer system of claim 40 wherein
the instructions for adding the work to the work schedule comprise instructions for adding the work to the work schedule according to a priority of the customer order.

45. The computer system of claim 40 wherein
the instructions for adding the work to the work schedule comprise instructions for adding the work to the work schedule according to an order date of the customer order.

46. A computer system comprising:
a processor; and
a memory, the memory storing instructions to be executed by the processor, the instructions comprising:
instructions for using a customer order for an item to determine material to manufacture the item;
instructions for identifying material to manufacture the item from an available inventory of the material;
instructions for adding work to a work schedule, the work being to manufacture the item at an operation of at least one operation of a manufacturing line using the identified material;

instructions for adding a delivery to a material delivery schedule, the delivery being of the identified material from the available inventory to the operation;

instructions for providing the work schedule to the manufacturing line for manufacturing the item according to the work schedule; and

instructions for providing the material delivery schedule for delivering the material according to the material delivery schedule.

47. A computer program product comprising:

instructions for repeating a series of steps a plurality of times during a manufacturing shift;

instructions for each step in the series of steps comprising:

instructions for using at least one outstanding customer order to generate a work schedule and a material delivery schedule, each customer order of the at least one outstanding customer order including at least one item, the work schedule including work to manufacture each item of the at least one item, the delivery schedule including delivery of material to manufacture each item of the at least one item;

instructions for providing the work schedule to a manufacturing line substantially immediately after generating the work schedule for initiating work to mass produce each of the at least one item according to the work schedule; and

instructions for providing the material delivery schedule for delivering the material to manufacture each item of the at least one item according to the material delivery schedule, wherein the material is scheduled to be delivered to an operation of at least one operation of the manufacturing line substantially immediately prior to the time the material is needed according to the work schedule; and

a computer-readable medium for storing the instructions for repeating, the instructions for using, the instructions for providing the work schedule, and the instructions for providing the material delivery schedule.

48. The computer program product of claim 47 wherein

the instructions to generate the material delivery schedule include instructions to generate the material delivery schedule such that the material scheduled to be delivered includes material scheduled to be delivered from an available inventory of material at a material source.

49. The computer program product of claim 48 further comprising:
instructions for determining the available inventory from at least one of a group consisting of the following:
an in-house inventory; and
an external inventory.

50. The computer program product of claim 49 wherein
the instructions for determining the available inventory from the external inventory include instructions for determining the available inventory from at least one of a group consisting of the following:
a supplier inventory; and
a hub inventory.

51. The computer program product of claim 48 further comprising:
instructions for determining the available inventory from at least one of a group consisting of the following:
an in-house inventory;
an external inventory; and
an in-transit inventory.

52. The computer program product of claim 47 wherein
the instructions to generate a work schedule comprise instructions for adding work to the work schedule; and
the instructions to generate a material delivery schedule comprise instructions for adding a delivery of the identified material from an available inventory to an operation of at least one operation on a manufacturing line.

53. The computer program product of claim 52 wherein
the instructions for adding the work to the work schedule comprise instructions for adding the work to the work schedule at a start time; and
the instructions for adding the delivery to the material delivery schedule comprise instructions for adding the delivery to the material delivery schedule at a material delivery time prior to the start time.

54. The computer program product of claim 52 further comprising:
instructions for determining an expected availability of the identified material from the available inventory;
and wherein
the instructions for adding the work to the work schedule include instructions for adding the work at a start time after the expected availability of the identified material.

55. The computer program product of claim 54 wherein the instructions for determining the expected availability of the identified material from the available inventory comprise:
instructions for determining whether the available inventory of material includes the identified material;
instructions for determining a replenishment time for the identified material and using the replenishment time to determine the expected availability of the identified material when the available inventory includes the identified material; and
instructions for determining that the expected availability is that the identified material is not available when the available inventory does not include the identified material.

56. The computer program product of claim 52 wherein
the instructions for adding the work to the work schedule comprise instructions for adding the work to the work schedule according to a priority of the customer order.

57. The computer program product of claim 52 wherein
the instructions for adding the work to the work schedule comprise instructions for adding the work to the work schedule according to an order date of the customer order.

58. A computer program product comprising:
instructions for using a customer order for an item to determine material to manufacture the item;
instructions for identifying material to manufacture the item from an available inventory of the material;
instructions for adding work to a work schedule, the work being to manufacture the item at an operation of at least one operation of a manufacturing line using the identified material;

instructions for adding a delivery to a material delivery schedule, the delivery being of the identified material from the available inventory to the operation;

instructions for providing the work schedule to the manufacturing line for manufacturing the item according to the work schedule;

instructions for providing the material delivery schedule for delivering the material according to the material delivery schedule; and

a computer-readable medium that stores the instructions for using, the instructions for identifying, the instructions for adding work to a work schedule, the instructions for adding a delivery to a material delivery schedule, the instructions for providing the work schedule, and the instructions for providing the material delivery schedule.

59. A signal embodied in a carrier wave comprising:

instructions for repeating a series of steps a plurality of times during a manufacturing shift;

instructions for each step in the series of steps comprising:

instructions for using at least one outstanding customer order to generate a work schedule and a material delivery schedule, each customer order of the at least one outstanding customer order including at least one item, the work schedule including work to manufacture each item of the at least one item, the delivery schedule including delivery of material to manufacture each item of the at least one item;

instructions for providing the work schedule to a manufacturing line substantially immediately after generating the work schedule for initiating work to mass produce each of the at least one item according to the work schedule; and

instructions for providing the material delivery schedule for delivering the material to manufacture each item of the at least one item according to the material delivery schedule, wherein the material is scheduled to be delivered to an operation of at least one operation of the manufacturing line substantially immediately prior to the time the material is needed according to the work schedule; and

a computer-readable medium for storing the instructions for repeating, the instructions for using, the instructions for providing the work schedule, and the instructions for providing the material delivery schedule.

60. The signal of claim 59 wherein

the instructions to generate the material delivery schedule includes instructions to generate the material delivery schedule such that the material scheduled to be delivered includes material scheduled to be delivered from an available inventory of material at a material source.

61. The signal of claim 60 further comprising:
instructions for determining the available inventory from at least one of a group consisting of the following:
an in-house inventory; and
an external inventory.

62. The signal of claim 61 wherein
the instructions for determining the available inventory from the external inventory include instructions for determining the available inventory from at least one of a group consisting of the following:
a supplier inventory; and
a hub inventory.

63. The signal of claim 60 further comprising:
instructions for determining the available inventory from at least one of a group consisting of the following:
an in-house inventory;
an external inventory; and
an in-transit inventory.

64. The signal of claim 59 wherein
the instructions to generate a work schedule comprise instructions for adding work to the work schedule; and
the instructions to generate a material delivery schedule comprise instructions for adding a delivery of the identified material from an available inventory to an operation of at least one operation on a manufacturing line.

65. The signal of claim 65 wherein
the instructions for adding the work to the work schedule comprise instructions for adding the work to the work schedule at a start time; and

the instructions for adding the delivery to the material delivery schedule comprise instructions for adding the delivery to the material delivery schedule at a material delivery time prior to the start time.

66. The signal of claim 60 further comprising:
instructions for determining an expected availability of the identified material from the available inventory;
and wherein
the instructions for adding the work to the work schedule include instructions for adding the work at a start time after the expected availability of the identified material.

67. The signal of claim 66 wherein the instructions for determining the expected availability of the identified material from the available inventory comprise:
instructions for determining whether the available inventory of material includes the identified material;
instructions for determining a replenishment time for the identified material and using the replenishment time to determine the expected availability of the identified material when the available inventory includes the identified material; and
instructions for determining that the expected availability is that the identified material is not available when the available inventory does not include the identified material.

68. The signal of claim 64 wherein
the instructions for adding the work to the work schedule comprise instructions for adding the work to the work schedule according to a priority of the customer order.

69. The signal of claim 64 wherein
the instructions for adding the work to the work schedule comprise instructions for adding the work to the work schedule according to an order date of the customer order.

70. A signal embodied in a carrier wave comprising:
instructions for using a customer order for an item to determine material to manufacture the item;
instructions for identifying material to manufacture the item from an available inventory of the material;
instructions for adding work to a work schedule, the work being to manufacture the item at an

operation of at least one operation of a manufacturing line using the identified material;

instructions for adding a delivery to a material delivery schedule, the delivery being of the identified material from the available inventory to the operation;

instructions for providing the work schedule to the manufacturing line for manufacturing the item according to the work schedule;

instructions for providing the material delivery schedule for delivering the material according to the material delivery schedule.